

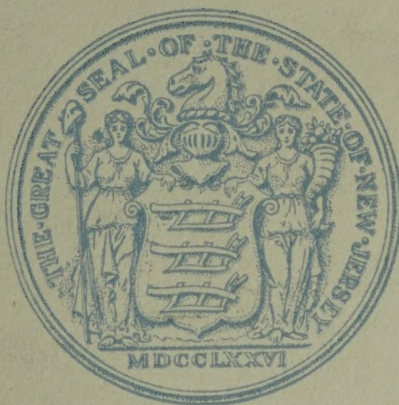
STATE OF NEW JERSEY

*The*

HIGHWAY DEPARTMENT

*A Report for*

1943



SPENCER MILLER, JR.

*State Highway Commissioner*

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## TABLE OF CONTENTS

	PAGE
Introduction . . . . .	iii
Operations . . . . .	1
Winter Safety Control . . . . .	15
Economics of the State Highway System . . . . .	21
Federal Aid Legislation . . . . .	26
Research Developments . . . . .	29
Construction Plans . . . . .	39
Financial . . . . .	57
Future Highway Trends . . . . .	65

*To: His Excellency, the Governor, the Legislature and the People of the State of New Jersey.*

The condensed report of the New Jersey State Highway Department for 1942 received such a cordial reception from public officials and the citizenry of New Jersey that we have decided to issue such a report each year for the general public. It should aid in a better understanding of State highway problems. It should engender a sense of pride on the part of New Jersey citizens in one of their important public activities. The official reports of the Department with all the supporting data and statistical tables will continue to be filed each year in the State Library. They will also be available at the headquarters of the State Highway Department.

The report this year has attempted through a series of pictures, maps and charts to present an interesting account of the past activities of the Department and of future trends. No effort has been made to present an extended discussion of either current activities or of future plans; that is to be found in the official report. It is hoped rather that these pages will serve to be suggestive of what is and what might be. In reading this report it will be well to remember that these are the activities of a department during wartime. All activities have been contracted to meet the war emergency; all efforts have been concentrated on the single objective of winning the war.

There are several new sections in the report this year. In particular the section devoted to the economics of highway construction presents for the first time the considered arguments for the investments which have already been made in highway facilities. It cannot be emphasized too frequently that the 350 millions of dollars which have been invested in the New Jersey State Highway System is to be considered not as a public *expense*, but rather as a public *investment*. The values added to the State through this public investment would total many more millions of dollars. But once constructed these highways do suffer obsolescence and must be maintained regularly and reconstructed at periodic intervals.

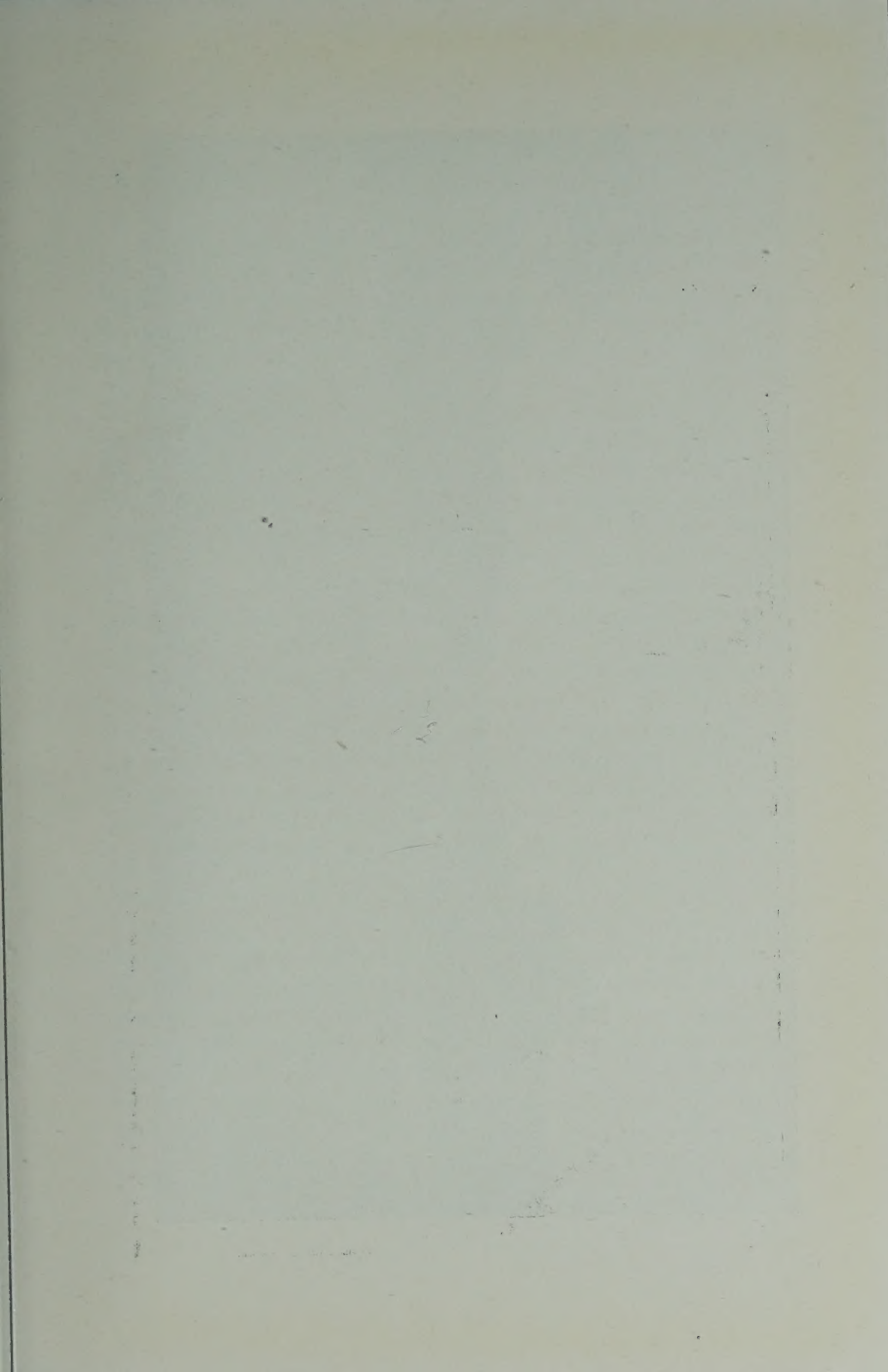
The section on Federal Aid also brings up to date the important discussions which have been taking place in the

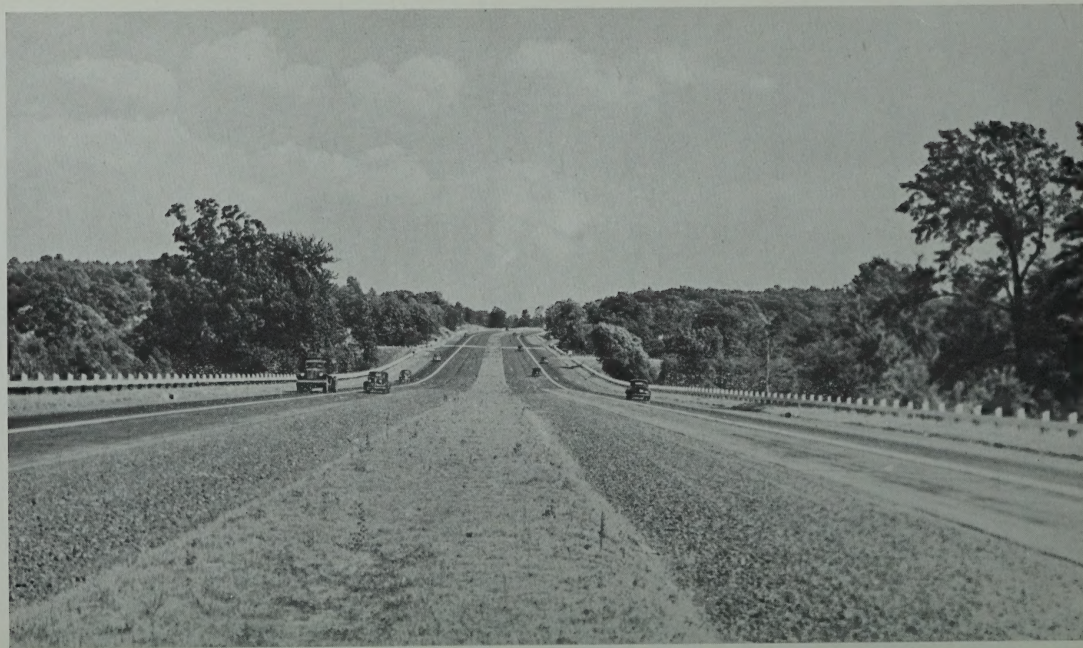
Congress of the United States and in highway circles concerning Federal Aid and in particular the relationship between the Federal Government and the State Governments in the important work of post-war highway construction. While it is yet too early to forecast what the nature of the Federal Aid Program will be, it is reasonable to assume that the principle of equality between the State and Federal Governments, both in the financing and the general control of the highway program will be adopted. It is hoped moreover, that in the Federal Highway Legislation a more equitable basis for distribution of federal funds will be found than that which has prevailed in the past.

The section on future trends of the highway brings to focus still another and most important aspect of the highway problem, namely, parkways. Parkway today are not to be considered luxuries, but a necessary part of a balanced highway program. In New Jersey particularly it is important that the program for highway development for the next quarter of a century should include ample provisions for the development of parkways so that the natural beauty of this State should be opened up and conserved for future generations. It is manifest that once the residents of this State come to recognize the part which parkways will play in the general program of conservation, as well as in highway development, there will be a public demand at once definite and insistent for a system of parkways which will conserve the natural beauty of every section of the state.

This report represents the cooperative services of various employees within the Department. To all of these who have collaborated in its preparation, we make this grateful acknowledgment. If those who read these pages are quickened to a new interest in highway problems, the purpose of the report will have largely been served.

SPENCER MILLER, JR.,  
*State Highway Commissioner.*





N. J. Route 6 (U. S. 46) between Clifton and Little Falls, Passaic County. The paving of this section closed the last gap on this major cross-State artery extending from the George Washington Bridge to the Delaware River.

# OPERATIONS

## CONSTRUCTION

Major construction activities during the past year were directed toward the completion of 16 access roads to military establishments and war industries, undertaken at the request of the United States Army and Navy. Eleven projects were completed and five others sufficiently advanced to permit their opening to traffic.

These improvements are now facilitating access to the Pica-tinny Arsenal in Morris County, the Naval Supply Depot at Bayonne, Forts Dix and Monmouth, the Motor Reception Park at Carteret, Island Beach Coast Guard Stations in Ocean County, and Camps Coles, Evans, Kilmer, Shanks and Woods.

The Federal Government completely financed these improvements through the United States Public Roads Administration under the Defense Highway Act of 1941. The burden of the maintenance of these access roads devolves upon the State Highway Department.

At the close of the year an additional contract was under way to the Wright Aeronautical Plant in Woodridge, Bergen County; and plans were in the course of preparation for projects to the Army Supply Depot at Belle Mead, Little Egg Coast Guard Station, and military installations at Highlands.

### *State Highway System*

In addition to the 35 miles of access road construction, operations were under way on 20 miles of the State Highway System. Contracts covering 13 miles of highways, seven stream bridges, one railroad and four highway grade separations were completed, and seven miles of highways, six stream bridges, two railroad and five highway grade separations were in various stages of completion at the close of the year and will carry over into 1944.

### *Improvements to System*

Three of the access roads resulted in valuable improvements

to the system. The Picatinny Arsenal road will comprise a portion of the proposed Route 6-A, extending from Route 6 at Dover in Morris County to Route S-31 at Ross' Corner in Sussex County.

The Fort Dix access road from Route 39 at Mansfield Square to the Pemberton-Wrightstown road in Burlington County, has been legislated as part of the system; and the grade separation and its approaches on Port Street, Newark, forms a portion of Route 25-B.

#### *Projects Classed as Access Roads*

Four other important projects were undertaken, which are similar to access roads.

The reconstruction of Broadway in Gloucester and Brooklawn, Camden County was completed. This is the main north-south artery adjacent to the Delaware River, and will facilitate access to the New York Shipbuilding and Penn-Jersey Shipbuilding Corporations. The financing of this contract was shared equally between the Federal Government and the State.

#### *Cheesequake Creek Bridge*

The new Cheesequake Creek bridge on Route 35 at Laurence Harbor in Middlesex County was opened to traffic in October. The former structure at this location, built in 1911, was not designed to carry the heavy weight and volume of present-day traffic, and was kept in operation only by excessive maintenance. It was also a weak link in the main highway leading to Forts Hancock and Monmouth, and the War Production Board gave it a high priority rating.

The new structure is of the single leaf bascule type, with an underclearance of 25 feet above mean high water. The bridge and its approaches provides two 32-foot traffic lanes, separated by a four-foot center safety island.

#### *Route 39*

The northerly end of the dual portion of the Fort Dix access road terminates on Route 39 at Mansfield Square, two miles south of Route 25 at Bordentown. This left an inadequate 20-foot pavement on poor alignment between these

points. It was, therefore, necessary to reconstruct and convert this section of Route 39 to a dual highway, contemporaneously with the construction of the Fort Dix road.

At the same time the widening of the bridge carrying the Pennsylvania Railroad over Route 39 at Mile Hollow, north of Bordentown, was also undertaken, making available a modern traffic artery from Trenton to Fort Dix.

#### *Route 25 and Port Street, Newark*

Congestion and delay to war workers occasioned by heavy crossing traffic at the intersection of Route 25 and Port Street in Newark, prompted the immediate undertaking of that part of the ultimate plan for modernizing Route 25 through Essex County, and providing for a grade separation at this location.

The improvement of Port Street (Route 25-B) completed in June, had merely transferred the point of congestion on that road to this intersection. This had been foreseen and the Department was in a position to cooperate with the Army, Federal Shipbuilding and Brewster Aeronautical Corporations, by promptly placing this project under contract.

It is expected that the improved facilities will be available for traffic about the middle of next year.

#### *Strategic Military Network*

Three important projects were under construction on the strategic military network.

The section of Route 28, known as the Lebanon relocation in Hunterdon County, a part of the ultimate plan of dualizing and modernizing this highway between Somerville and Clinton, was completed in November. By-passes at White House and North Branch were opened earlier in the year.

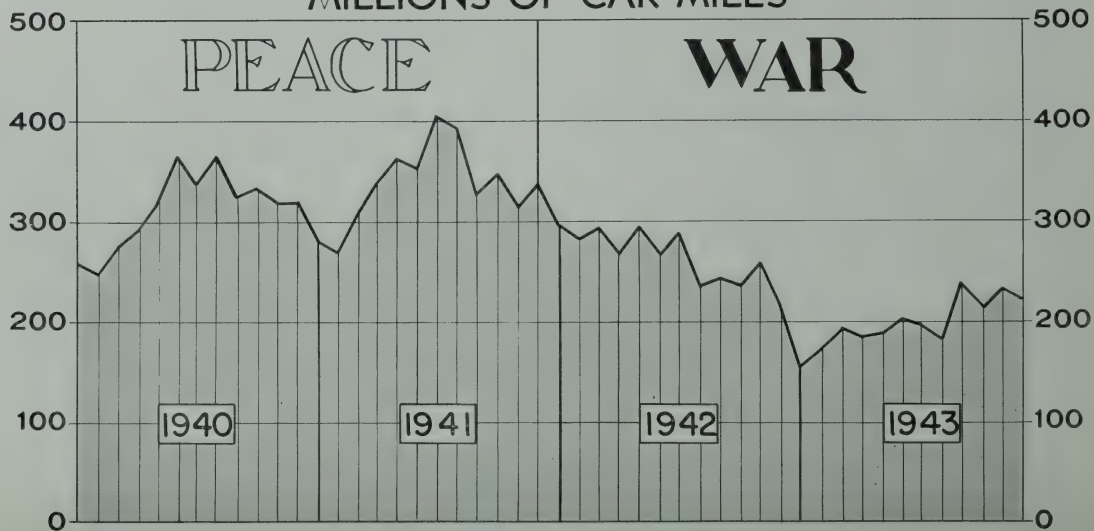
The old road through the business section of Lebanon was narrow, and conditions were congested and hazardous for many years. Four unimproved gaps at the end of and intersticed between the three relocations already constructed, must await undertaking after the war.

#### *Route S-3*

Construction of the viaduct to carry this route over Berry's Creek and the Erie Railroad, started in 1942, is still under

# TRAFFIC VOLUMES -- STATE HIGHWAY SYSTEM

## MILLIONS OF CAR MILES



way. This project crossing the Hackensack meadows between Route 2 at Rutherford and Route 3 at East Rutherford in Bergen County, has held up the completion of this important link in the highway approaches to the Lincoln Tunnel.

Serious sub-surface difficulties were encountered, and it was necessary to alter the general plan of design by providing an additional length of viaduct on approach spans approximately 140 feet long at each end, instead of embankment approaches.

After a series of conferences both in New York and Washington, and the preparation of supporting documents, it was finally possible to persuade the federal authorities that the work should be completed and the construction financed in part with Federal Aid.

#### *Route 6*

In 1930, surveys were undertaken and a line developed for that portion of Route 6 through Passaic County, from Union Avenue at Little Falls to the Passaic River in Clifton. For many years this had been the vital "missing link" on this major cross-state artery extending from the Delaware River at Delaware to the George Washington Bridge at Fort Lee, and comprising the main approach to the northern New Jersey metropolitan area from the west.

This gap was closed on December 9 by the opening of the two and one-half mile section through Great Notch, from Union Avenue, Little Falls, to Valley Road in Clifton.

Furthermore, the Paterson area has been relieved of the heavy through traffic, which has interfered with its business and community life for many years.

#### *Naval Ammunition Depot at Earle*

At the request of the Navy Department, the Governor by proclamation waived legal requirements to permit unlimited vehicle loads, in order to facilitate transportation of materials necessary for the construction of the Naval Ammunition Depot at Earle in Monmouth County. Loads 75 per cent in excess of the legal limit were transported, and it was recognized that such over-loading might seriously damage the pavement, yet it was regarded as one of the war's necessities.

The Federal Government had provided for such emergen-

cies under an act approved in 1943 (*Public Law 146, 78th Congress*) for the repair of highways damaged by the Army, Navy, other agencies of the Government, or their contractors.

The Department, County of Monmouth and the Townships of Howell and Middletown, cooperated with Navy officials concerning this essential project. Certain townships roads will be closed and other means provided for public travel. A government railroad and highway approach to the site crosses several state and county thoroughfares. The Navy Department agreed to construct grade separations at important crossings upon the representations of the State Highway Department.

## MAINTENANCE

The maintenance of the State Highway System in 1943 totaled \$3,077,707.00, details of which are shown on the following graph; \$234,049 being for reconstruction.

It was necessary, by reason of personnel shortages, to curtail operations materially. The total and average cost per mile for the maintenance of the main pavement show an increase, particularly in the case of concrete pavements. There was an unusually large amount of pavement failures by reason of expansion during extremely high temperatures. Studies are under way to determine the causes, and, if possible, eliminate them in future work.

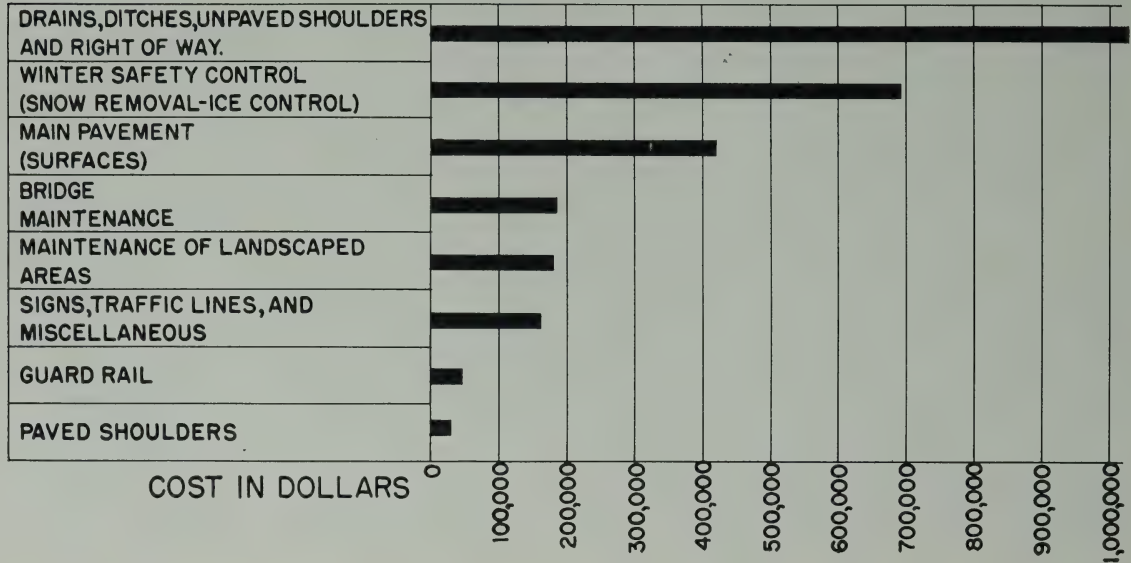
### *Encroachments*

In accordance with a program of roadside improvement inaugurated by the State Highway Commissioner, the abatement of encroachments on highway rights of way was actively carried forward during the latter half of the year.

A survey indicated a total of 7,438 encroachments, consisting of signs of various types, gasoline pumps, fences, hedges, buildings and miscellaneous structures, and a form letter was forwarded to those maintaining these encroachments inviting cooperation in their removal.

This procedure was actively sponsored by a committee of citizens of the State interested in roadside improvement, known as the Advisory Committee on Roadside Improve-

## MAINTENANCE OF STATE HIGHWAY SYSTEM-1943



ments. The most encouraging result of the whole campaign were the favorable responses received. The large gasoline distributors, in particular, were most cooperative. While the actual abatement of encroachments at many service stations was not secured because of manpower limitations and the regulations of the War Production Board, it is believed this type of encroachment will eventually be eliminated.

It has also been necessary to grant deferments to many individuals because of the war emergency. The actual number of eliminations has been such, however, as to indicate the ultimate success of the program.

A second letter has been sent to those who did not respond to the initial letter. By this procedure everyone will be put on notice and given an opportunity to cooperate in this civic effort.

### *Snow Removal and Ice Control*

Considerable emphasis was placed on the importance of snow removal and ice control by the military authorities during the past winter season. As military activities increased even greater stress was laid on the importance of these operations.

The program, as outlined, provided for snow removal on 1,653 miles of the system. Considerable difficulty was experienced in its organization and several meetings of county and municipal engineers were held at the headquarters of the State Highway Department for the purpose of trying to work out means for expediting traffic during snow storms by the elimination of parking and other factors which tended to delay such operations.

As a further aid, the State Highway Commissioner by order of the Governor was named Snow Coordinator for the State. In this capacity the interlocking operations of the State, counties and municipalities were formed into an efficient organization, whose sole purpose was to keep New Jersey's vital highways not only clear from snow, but safe for travel throughout the winter months.

There was also arranged a cooperative set-up with state and local civilian defense authorities, and arrangements were made

whereby volunteer personnel could be obtained through the civilian defense organization.

The chapter on "Winter Safety Control" outlines in detail the component parts of this program.

### *Bridges*

In 1942 provision was made for taking care of any possible damage to bridges by sabotage or enemy action. As the year progressed the demands of the military authorities with respect to the guarding of these structures gradually decreased.

The most troublesome situation occurred at the Loveland-town Bridge over the Inland Waterway near Point Pleasant, where, because of progressive erosion and a heavy storm, conditions reached a point where extraordinary steps were necessary to correct the conditions. It was necessary to take the bridge out of service the latter part of October in order to proceed with the needed repairs, which may require six months.

### *Signs, Markings, Landscaping*

Where new sign installations were required, it has been necessary to use other than permanent materials.

The restricted operations in connection with traffic lines have been continued in accordance with amendments passed by the Legislature. The cost was slightly higher than in the previous year, but it is still under one cent per foot per year.

Landscaping operations were confined to a maintenance basis, and forces engaged in this work were sharply reduced in number. The operations performed, however, were sufficient to conserve investments already made.

## ELECTRICAL

In accordance with the reduction in traffic volumes and speeds obtaining during the war, it was possible without sacrifice of safety, to reduce in candle power 2,846 lighting units and to disconnect from service 3,104 other units, resulting in a saving of over \$153,000. Much of this was in conformity with government regulations.

### *Traffic Signals*

Cooperation was effected with the Motor Vehicle Department, covering the operating characteristics of all state-maintained traffic signals, with the view to converting, where feasible, signals of the "normal out" type to the "normal green." As a result of this study 22 signals were converted.

A joint study was also undertaken to determine in what manner the operating characteristics of traffic signals might be changed or modified to obtain improved control of vehicular movements under existing traffic volumes. Six signals were re-timed, 14 flashing mechanisms applied to existing signals and 16 signals, normally traffic-actuated, were converted to the flashing type.

### *Electrical Drawbridges*

Two new electrical drawbridges, the Hudson and Manhattan over the Passaic River at Newark, and the bridge over the new Cape May Canal on Route 4, were placed in operation, bringing the total number of movable span bridges on the system to 35.

## LAND ACQUISITIONS

The policy inaugurated in 1942 of relying on the Department's right of way agents with respect to appraisals in land acquisitions, continues to prove effective, a higher percentage of properties on new projects being acquired by agreement than in any previous year during the past decade.

Further, an exceptionally large percentage of the awards rendered in condemnation were in accordance with Department appraisals.

During the past year, 213 properties were acquired by direct agreement with property owners in the amount of \$773,971.00, and 60 properties were acquired through condemnation or by compromisory settlements after condemnation awards totaling \$56,094.00. At the close of the year 26 parcels were awaiting condemnation hearings, and of these 12 had to be condemned because of involved titles or inability to locate owners.

The lands acquired were for rights of way on 127 sections

of the State Highway System, and included properties located in each of the 21 counties.

### *Route S-3 Acquirement*

The largest project in right of way acquirement was for the proposed Route S-3 through the Borough of Rutherford in Bergen County. There were 142 properties located on this section, of which 120 were improved. Negotiations were started in the early summer and 80 parcels were acquired at prices within the range of Department appraisals.

Some 77 buildings were subsequently sold en bloc for \$35,-000 after extensive advertising. This sale at an average price of \$455 per building is higher than ever obtained for an assortment of similar dwellings, sold individually or in small blocks. This method of procedure is considered particularly advantageous as the purchasers were obligated to clear all buildings and appurtenant structures from the right of way, including demolition of the foundations to the ground line and the removal of all debris.

The success of the project was due in part to a new policy inaugurated of holding a series of meetings with the borough authorities at which the following objectives were agreed upon: to preserve tax ratables; arrange for the orderly and systematic removal of buildings to new sites; allow owners and tenants ample time to secure new homes, and reduce all possible points of friction.

### STATE AID

The construction of municipal roads with State Aid funds was greatly curtailed by the issuance on March 15 of an order prohibiting the construction of any project exceeding \$1,000 without direct authorization from the War Production Board. A large number of municipalities submitted applications for authorization to proceed with construction under this regulation, and authority was granted where there was no direct conflict with the war effort.

Subsequently, the War Production Board ruled that improvements might be carried out if processed materials were not involved. This permitted the construction of 47 miles of

# RURAL ROAD PROGRESS IN NEW JERSEY



UNIMPROVED ROADS



IMPROVED ROADS

1926

13,000 miles

7,000 miles

1943

6,000 miles

14,000 miles

gravel roads, which could be completed satisfactorily without drainage installations, involving only earthwork and gravel surfacing.

During the year 62 miles of municipal roads were completed, the lowest number since 1920. However, State Aid funds are now available from appropriations for a program of five and one-half million dollars at the war's end.

### *Maintenance Programs*

The war-time restrictions also affected the maintenance programs in the counties and municipalities, which were reduced to a minimum, it being necessary to secure the approval of the United States Public Roads Administration for the use of all bituminous materials.

This restriction was removed on September 13, and will make possible larger maintenance programs in the immediate future.

## TESTING

The Laboratory received and tested 6,215 samples of various types of materials used in construction programs. This is considerably below the total tested annually for several years past, when an average of 18,000 to 20,000 samples were received.

However, the construction of projects requiring the use of bituminous materials increased, due to the rescinding of regulations by the federal authorities.

### *Bituminous Materials*

Inspectors in the New York district submitted samples representing 12,619,772 gallons of various grades of bituminous materials. These represented stocks of the various grades held in storage by different producers, some of which was for shipment to New Jersey.

Of this quantity, there was applied to construction in which state funds were used, 7,105,389 gallons, an increase of 4,958,884 gallons over the previous year.

It is expected that a considerably greater quantity will be used in the forthcoming year. In July of 1942, inspection at

the point of production was suspended in the Philadelphia district. However, the Department has been informally advised that some of the former producers in this district will again supply the required materials. This will necessitate the reassigning of an inspector to this area.

### *Slab Tests for Navy Department*

Tests were conducted on special compressed bituminous slabs in conjunction with a Navy program for the use of this type of material as an insulator for decks, housing and other utilities on ships in order to protect them against bombings or shellings.

This involved 12 complete mechanical analyses on various samples, the determination of specific gravities on two samples, and the recovery of the asphalt from four samples to determine the characteristics after it has been incorporated in these mixtures.

## EQUIPMENT

The Department made every effort further to reduce the use of all types of automotive equipment, to aid in the nationwide conservation of gasoline and rubber. Automotive travel was reduced from 5,844,872 miles in 1942 to 3,148,000 during the past year, a reduction of 2,696,872 miles, representing a saving of 46 per cent.

This was accomplished by the general sharing of car usage, using public conveyances where possible and reassigning personnel. All employees conscientiously cooperated in this effort at considerable inconvenience to themselves.

## WINTER SAFETY CONTROL

The phenomenal growth of winter safety control operations during the past 22 years has been such as to more than triple expenditures and the amount of equipment used, increase the use of abrasives in ice control ten-fold, and increase by 250 per cent the state mileage plowed.

From an expenditure of \$216,000 in 1922, winter safety costs have increased to a high of \$850,000 in recent years. During 1943 there was expended \$692,000 in ice control, snow fence and snow removal operations.

In the past winter season these operations covered 1,653 miles of the State Highway System, compared with 622 miles in 1922. Further, the construction of multi-lane and dual highways, traffic circles and highway grade separations in recent years, has actually increased the mileage plowed—in terms of the two-lane roads of 1922—to 2,800 miles.

The composite parts of the Department's winter safety control operations are recorded in five expensive items: plowing, snow fence, patrolling, chlorides and abrasives. The item of abrasives in ice control involves a cost of more than 50 per cent of the total expenditures and has expanded more than any other winter maintenance item in the past several years.

### *Plowing*

Removing snow from the highways includes a number of combinations of snow plows with trucks, tractors and graders. An inventory of major equipment used for snow removal on the System lists 550 displacement plows, 10 rotaries for truck and tractor attachment, and 618 trucks, tractors, graders and snow loaders. Trucks used in plowing range from one and one-half tons up to the powerful 10-ton units.

Speed is an important factor in the opening of heavily traveled routes, and for this reason high-speed snow removal equipment is necessary. Speed in displacement plowing has been found valuable not only for the quick opening of highways, but also because a fast-moving plow throws snow completely off the road and shoulders.



Highways quickly cleared of snow with multiple plows.



Rotary plows speedily dispose of big drifts.

### *Snow Fence*

Pre-winter maintenance through power-mowing and the removal of brush and other obstructions along the right of way, which may cause drifting, is a great aid in keeping traffic moving with a minimum of plowing expense through the winter months. Snow fence is another. The fence drifts the snow off the road and allows normal plowing rather than the plowing of drifts.

Roadside plantings to replace snow fence is coming to be accepted as a superior method of drift control. Roadside landscape improvements are becoming more popular, and a multiple objective is attained if a drift-control plan can be incorporated into a landscape project.

In the setting up of snow fence previous experience in the location of drifts is the best criterion for points at which it should be erected. This, however, is not always final because of unusual weather conditions, which sometimes cause drifting at unexpected places and in an extraordinary manner.

Where snows are heavy, the installation of the fence brings about great savings in plowing costs. The result is that better service can be given to the motorists for the same amount of money expended.

### *Ice Control*

Providing adequate safety on the highways during the winter has become a major problem, requiring constant vigilance on the part of the maintenance forces. The need for such extraordinary care is demonstrated by the fact that the winter accident rate in New Jersey increases  $22\frac{1}{2}$  per cent over the summer rate.

Many combinations of weather cause the formation of ice on pavements during the winter. These include freezing rain, sleet, foggy conditions with near freezing temperatures, cloudy weather with a low temperature and a high humidity, snow from previous storms alongside the road alternately thawing and freezing, and snow near the freezing point coupled with a sudden drop in temperature.

A large number of accidents that occur on icy roads are the result of skidding. It is the maintenance crews that are ex-

pected to provide skid-proof pavements for winter travel. Maximum safety calls for the use of treated abrasives, spread evenly over the surface. A wide variety of materials is used in ice-control operations. The best of these appears to be cinders because of their hardness and irregular shape, enabling them to dig into the ice more efficiently and at the same time afford a grip for the tires.

The treatment of abrasives with chlorides is very necessary where freezing temperatures prevail during most of the winter. Besides aiding in anchoring the abrasives, they greatly help in the removal of the ice through their chemical action.

Efficient ice control also requires the placing of stock piles of abrasives alongside the road at reasonably close intervals, so that the maintenance crews spreading the abrasives can fill their trucks and proceed in one direction without back-tracking for fresh supplies.

Speed of operation and a good tie-in with the Weather Bureau in receiving storm warnings also aid materially in preparing for emergencies. Also of great importance are the efficiency of the maintenance organization and the loyalty of the men who are required at any time of the day or night to go out into a storm to furnish protection for the motorists.

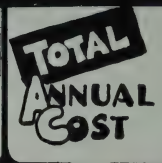
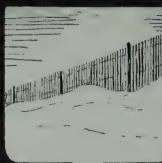
Ice-control operations are particularly complicated at numerous locations because some shifts of war workers, under the daylight saving regulations in effect during the winter months, are forced to travel in darkness to reach their employment, which makes it necessary for the maintenance crews to work constantly during the hours of darkness.

### *Expenditures*

The following chart shows the cost of snow removal in relation to ice control and the erection of snow fence over the past four years, together with the average snow fall during this period.

It will be noted that ice control represents approximately 50 per cent of the combined operation. This is due to the increased public demand for added winter protection, and also reflects the fact that ice conditions do not necessarily follow the "snow fall" line. Where a "trace" of snow, unmeasured

# WINTER SAFETY CONTROL



	SNOWFALL IN INCHES	SNOW REMOVAL	ICE CONTROL	SNOW FENCE	COMBINED OPERATIONS
1940	28	\$303,000	\$283,000	\$79,000	\$665,000
1941	33	\$460,000	\$280,000	\$95,000	\$835,000
1942	17	\$161,000	\$308,000	\$101,000	\$570,000
1943	18	\$254,000	\$352,000	\$86,000	\$692,000

by the Weather Bureau occurs, extremely hazardous conditions may prevail, requiring serious attention on the part of all maintenance personnel in the area affected.

This clearly demonstrates that appropriations for winter safety control operations cannot be predicated on any previous average experience. Maximum previous costs should prevail, with a suitable allowance for the increased demand for protective measures in ice control, since weather conditions are extremely unpredictable.

## ECONOMICS OF THE STATE HIGHWAY SYSTEM

Since 1917 New Jersey has been constructing a State Highway System on a preconceived plan. The cost to date has been \$350,000,000, of which the United States Government has contributed approximately \$47,000,000 through Federal Aid. In its present state of completion, the motorists of this State are saving \$36,800,000 per year due to operation over high-type surfaces, instead of the low-type surfaces which formerly existed. While it can be shown that this figure is approximately one and one-quarter cents per mile, a figure of one cent per mile is used.

But this is not the only tangible saving which the motorists of New Jersey are enjoying as a result of their investment in the State Highway System. In the construction of these roads every effort has been made to further reduce operating costs by removing traffic obstructions and saving distance by realignment. The total distance eliminated to date is 150 miles. This represents a saving of \$6,570,000 per year at a cost of operation of two cents per mile for excess distance travelled.

There are also savings due to the time saved, not only by the elimination of this excess distance, but also because of the higher average speeds at which a vehicle can safely operate on a high-type compared with a low-type surface. While no exact figure can be ascertained to cover all cases, it is believed that a conservative estimate would indicate a 33 per cent saving in time. This represents an increase in average speed from 30 miles per hour to 40 miles per hour.

Highway economists have devoted much study to evaluating time-saving. Although many would give higher figures, a value of 24 cents per hour per person is indicated. It has been determined by traffic count that the average car occupancy is two and one-half persons, so that this gives a passenger-vehicle saving in cost of 60 cents per hour.

When it is considered that approximately 17 per cent of New Jersey registrations are trucks and other commercial vehicles, the estimate just given is very conservative. This

# OPERATING SAVINGS TO MOTORISTS

## STATE HIGHWAY SYSTEM

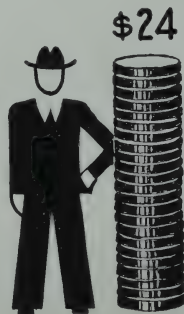
EACH CAR OWNER SAVES

**\$65 Per Year**

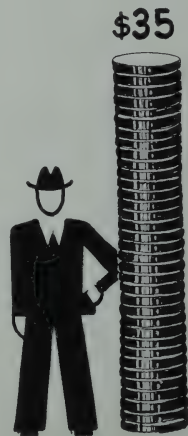
AS FOLLOWS:



SHORTER DISTANCE  
TRAVELED



TIME  
SAVED



HIGH TYPE  
SURFACES

time-saving is valued at \$18,400,000 per year in traveling over superior surfaces. There is also a time-saving due to the elimination of 150 miles of unnecessary travel, which gives an additional saving of 8,210,000 vehicle hours at a speed of forty miles per hour, representing a value of \$4,930,000 per year.

There are, then, tangible savings in operation to the motorists totaling \$66,700,000 per year because of the present state of completion of the State Highway System.

There are in addition many intangible benefits which cannot easily be evaluated, such as recreational value, increased business for the state's shore and lake resorts, better and cheaper educational facilities and the broadening influences of travel, contact with nature, and increased social activities.

What is the cost of these highways which save so much to the people and give so many benefits? The State Highway System has so far cost \$350,000,000. The upkeep of the System, including all classes of maintenance, lighting and drawbridge operation, is \$3,850,000 per year. If all of the capital expenditure were to be paid back, free and clear over a 40-year period, the interest and amortization at four per cent would be \$17,680,000 per year. Assuming that the surfaces wear out in 25 years, four per cent of the pavement must be renewed each year, amounting to \$4,750,000 annually. These total \$26,280,000 as a yearly economic charge against the operating savings of \$66,700,000, leaving a net yearly saving of \$40,420,000. This represents a yearly return of over 11 per cent on the investment for the tangible savings alone.

At the end of the 40-year period the investment would be retired, free and clear, and there would still be a large public ownership in rights of way, bridges, and surfaces, which would continue to yield a handsome return indefinitely as long as highways were necessary in the life of the people.

Considered from another view, if the capital expenditure were to be retired out of savings accrued each year, the item of amortization could be eliminated, leaving about \$50,000,000 per year to be applied to the retirement. This sum, without earning any interest, would retire the total sum spent in ap-

proximately seven years, after which there would be only an annual charge of maintenance and replacement amounting to \$8,600,000 per year, against gross savings of \$66,700,000 per year. In other words, the roads already built would then be returning to the people by economies of operation a net profit of over \$58,100,000 per year on a system which had already paid for itself.

On the other hand, if the total savings to date could be determined it could be concluded that the System, even during the course of construction, has more than paid for itself. Assuming that the rate of increase of these yearly net savings have grown from nothing to their present size over the past 27 years at a uniform rate, the total saved to date would be over \$545,670,000.

This picture has been obscured in the past because these savings were invisible and accrued to the owners of motor vehicles largely without their knowledge, or at least they were but vaguely realized.

Mention has been made that 17 per cent of New Jersey's motor vehicle registrations are trucks and other commercial vehicles. This does not mean that only 17 per cent of the traffic is commercial. Many varying estimates have been made of the percentage of commercial traffic, but a conservative estimate is 60 per cent.

For instance, much of our food is delivered to markets and stores by trucks. The cost of this food necessarily includes a charge for highway transportation. Not only food, but almost every product used in our daily lives includes a charge for highway transportation. The failure to receive these savings in the cost of highway operation must necessarily be reflected in a higher cost of living to the people of New Jersey.

An examination of the cost of motor vehicle operation in New Jersey in relation to total income is significant. The United States Department of Commerce estimates the total income for the State at \$3,737,000,000. The operating cost of the State's 1,041,700 motor vehicles, averaging 12,000 miles per year at four cents per mile, is \$500,000,000 or about 13½ per cent of the state's total income.

What other phase of the life of the people, except food and shelter, takes so large a share of this income? This cost is inescapable and can only be decreased by economies in the operation of motor vehicles. And this in turn can be brought about only by the construction of HIGH TYPE—TIME-SAVING—AND DISTANCE SAVING ROADS.

## FEDERAL AID LEGISLATION

For many years the Federal Government has provided grants-in-aid to the states to assist them in building a connected system of all-weather highways throughout the country. The first object of such Federal Aid was "to take the motorist out of the mud." Because of the large areas of certain states which were poor in economic resources and small in population, the distribution of aid favored these sparser sections of the country. The justification for providing such an unbalanced distribution was to insure a minimum travelable system throughout the nation. This distribution favored the states least able to provide such a system.

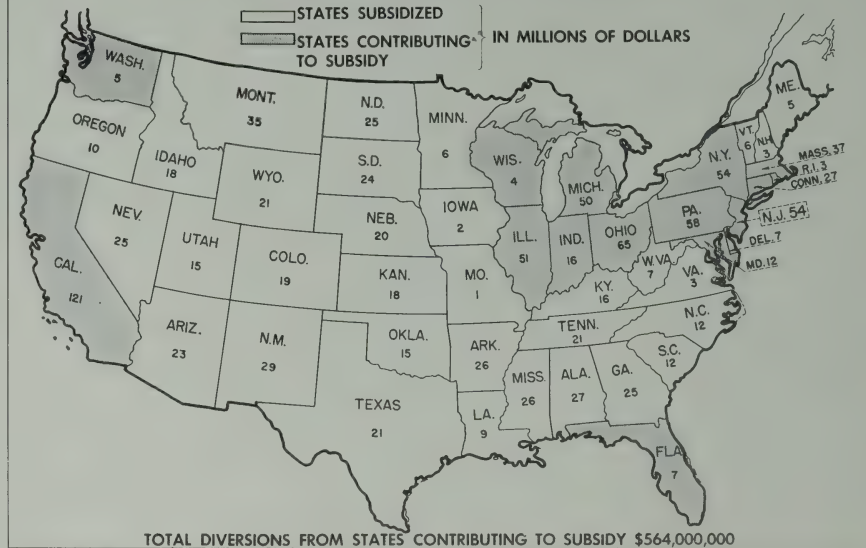
After 25 years of road construction under this program the motorist has been taken out of the mud. The reason for the continuation of this unbalanced distribution of aid no longer exists. Minimum needs have been more than met. Today a plan is proposed for a greatly enlarged program of post-war highway construction under the same distribution. The result of such an apportionment would give many states that formerly were not able to provide for their minimum needs much better highway facilities in relation to their traffic loads than they need. It would further penalize those states whose taxpayers have supported the Federal Aid program consistently throughout that period.

For instance, in the 19 years from 1924 to 1942, New Jersey received in Federal Aid about \$49,000,000 out of a contribution of New Jersey taxpayers of \$112,000,000 toward the total program. That is, \$63,000,000 of that contribution went to build roads in states other than New Jersey. This is a serious, though little recognized diversion. About 15 States have been the largest contributors to the Federal Aid program, and 33 States have been receiving subsidies under the distributing formula which apportions the money on the basis of one-third population, one-third area, and one-third post road (rural delivery) mileage.

To continue this distribution of federal funds with slight modification and to apply it to a vast three-year post-war pro-

# FEDERAL DIVERSIONS OF FUNDS

COLLECTED IN SOME STATES FOR SUBSIDIES TO OTHER STATES  
UNDER HOUSE OF REPRESENTATIVES BILL 2426  
(BASED ON FEDERAL MOTOR VEHICLE IMPOSTS)



gram would appear to be unjust and unnecessary. Such a proposed distribution would not provide post-war employment as it fails to provide road funds adequately to those states where unemployment is likely to be the greatest.

In cooperation with a few other states similarly situated, this Department is endeavoring to obtain a revision of the principles underlying the proposed distribution of Federal Aid. The purpose is to devise a scientific formula so that the taxpayers of New Jersey and other contributing states will get back from the Federal Government a larger portion than 40 or 50 per cent of their contributions in support of the federal road building program. Although a continuance of some aid to other states from New Jersey taxpayers is doubtless justified in the national interest, it appears that the diversion of more than \$25,000,000 in the three post-war years is unwarranted. The efforts of several states, acting as a group before the Road Committee of Congress, have already reduced this diversion to other states by half. The Department is continuing its efforts in this direction with the hope of having a larger portion of our road dollars spent at home.

## RESEARCH DEVELOPMENTS

A modern highway is no better than the research that went into its design and construction. Tests, investigations and experiments leading to the improvement of New Jersey highways are of basic importance in developing greater structural strength and better designs for operational use.

Highways are subject to the same factors of obsolescence and deterioration as any other property. The savings in maintenance, replacement and functional obsolescence by reason of research can be a huge proportion of the money spent for roads.

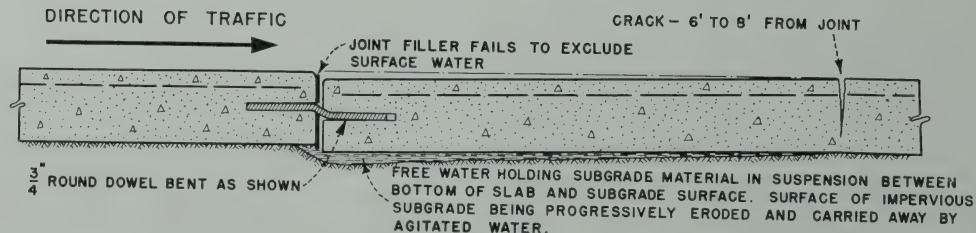
As far back as 1931, for example, trouble was experienced with joints in concrete pavements. Every effort was made to learn from others the causes and remedy. The attempt was unsuccessful—the phenomenon was a new one. The Department studied the problem for many months. The research included the construction and partial destruction of a test road by heavy truck loads.

Maximum use was made of the knowledge gained from this experiment, and a new type of joint, capable of supporting heavy loads without deterioration, was devised and has been used with minor modifications since 1934. Heavy trucking incident to the war effort has accentuated this trouble and caused many pavement failures in other localities, but no pavement constructed on the New Jersey State Highway System since 1934 has failed from truck loads.

The experiment has also saved the State a very large sum in avoidance of early replacement. The return on this research project has been many times its cost in terms of the investment in concrete pavements in New Jersey.

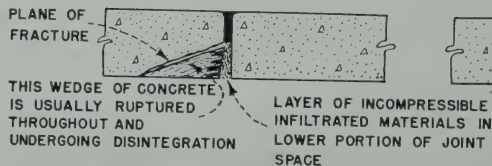
### *War-time Pavements*

Periodic inspections were made throughout the year of "war-time" concrete pavements recently constructed in accordance with designs developed during the emergency.



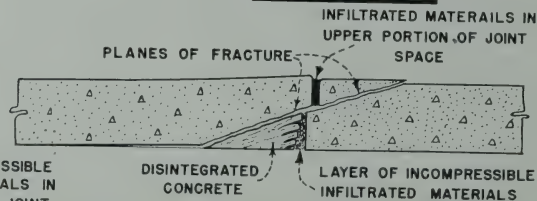
## CONDITIONS OF STEPPED-OFF CONCRETE PAVEMENT JOINT

### PARTIAL FAILURE



BOTTOM CORNER FRACTURE AT INFILTRATED EXPANSION JOINT

### COMPLETE FAILURE



BLOW-UP AT INFILTRATED EXPANSION JOINT

## CONDITIONS LEADING TO BLOW-UP OF CONCRETE PAVEMENT

Steel reinforcement and steel joint structures were omitted from these pavements and, in general, contraction joints were installed to control cracking. The behavior of these contraction joints in the Fort Dix access road has been carefully observed, and numerous measurements taken relative to the range of movement occurring at both the expansion and contraction joints to determine the merits of this type of construction.

### *Joints*

Considerable research was performed in the matter of eliminating certain deficiencies in the beam-type joint adopted as standard in 1934. Generally speaking, this joint has performed very satisfactorily, especially in eliminating "pumping" and "stepping-off" which are very serious defects in older pavements.

Although its basic features have been maintained, the design of the beam-type joint has been materially improved in several respects during the past year, especially in the matter of attaining a higher degree of accuracy in installation.

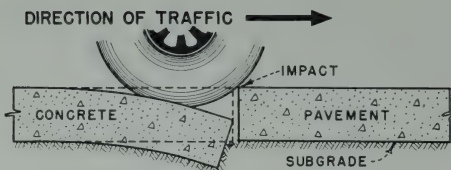
### *Joint Filling Materials*

Study of various types of joint filling materials was continued. Experiments relative to the performance of pre-compressed wood, initiated in 1942, were continued and new methods of testing devised. Specific attention was given to the question of the most suitable woods, grain direction, form of fabrication, methods of manufacture and installation procedure. An uncompressed wood filler for use in joints until such time as pre-compressed wood is available was also designed.

Another item of research was the relation of the width of joints to shock and noise experienced by the travelling public. Improved tools and methods of joint edging were devised which should materially improve the riding qualities of the pavement.

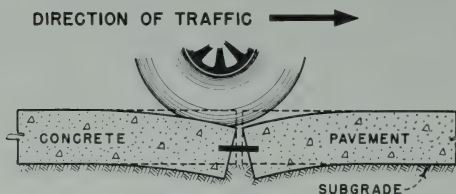
### *Sub-Base*

The Department carried on research into sub-base materials, frost-heaving and sub-drainage. The "blowing-up" of the pavement, which has become quite extensive in recent



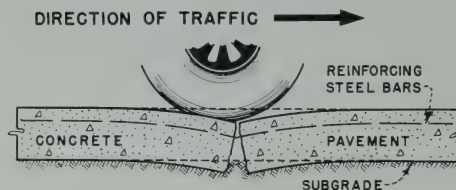
### BUTT JOINT

NO CONNECTION  
BETWEEN SLABS



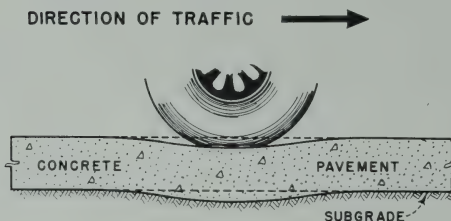
### LOAD TRANSFER JOINT

SLAB ENDS TIED  
TOGETHER DIVIDING  
LOAD BETWEEN  
THEM



### CRACK

STEEL BARS IN  
PAVEMENT PERFORM  
SAME FUNCTION AS  
ABOVE



### NO JOINT OR CRACK

LESS DEFLECTION  
AND MORE UNIFORM  
SUPPORT

**THE EFFECT OF HEAVY WHEEL-LOADS ON  
CONCRETE PAVEMENTS.**

years, prompted investigation where "blow-ups" and pavement buckling had occurred.

It was found that this situation resulted from a combination of slab growth and incompressible foreign materials which had infiltrated and replaced the bituminous filler in the joint spaces.

Investigations thus far indicate the desirability of further serious study and investigation of the causes of concrete growth and the improvement of joint fillers.

### *Soils*

Investigation was continued to determine the nature and characteristics of soils native to New Jersey as related to highway construction. Although particularly unfavorable soil conditions have always received special treatment, no general soil classification has been attempted with respect to the less obvious characteristics of soils.

From the standpoint of highway construction, susceptibility to frost action is a very serious defect in underlying soils, inasmuch as no type of pavement is immune to its extremely damaging effects. This phase of the research program is receiving and will continue to receive great attention.

### *Drainage*

Research and study of drainage and drainage conditions were undertaken in an endeavor to advance previous knowledge on this subject. Many formulas have been in existence for calculating drainage runoffs and the capacities of drainage structures, and an attempt is being made to standardize the method to be used.

A new chart of standard practice for the design of small drainage structures is in preparation. A new set of rainfall frequency-intensity curves has also been prepared and is being checked and reviewed by competent interested parties. A more efficient entrance to drains and culverts is being studied, and a tentative standard apron at inlets has been developed in an effort to improve runoff in a manner that will reduce maintenance cost.

Complete standardization of drainage design is not prac-

tical. Sound judgment and experience in selecting the various factors and data involved must influence decisions as to the designs finally selected.

### *Shoulders*

The problem of the construction, use, maintenance and replacement of shoulders also engaged the attention of the Department research staff. The cost of maintaining shoulders is considerably in excess of maintaining road surfaces. Serious thought is being given to possible economies in providing a higher type of shoulder in the first instance, thereby reducing the cost of their maintenance and of cleaning drainage structures, which become clogged by wash from unpaved shoulders.

### *Resurfacing Concrete Slabs*

An experiment was conducted in one county in connection with the disintegration of concrete slabs caused by the chemical action of salt used as an abrasive in ice-control operations.

Experiments on certain slabs indicated that it was possible to renew the surface with a thickness of not more than one-half inch, by thoroughly cleaning the pavement with compressed air, applying a grout of cement and allowing this to take its first set, and then adding a mixture of one part cement, one part sand and two parts half-inch clean stone.

It is believed that this will prevent further disintegration of concrete pavements due to the chemical action of winter abrasives. It may even provide a new service by the Department to city and local road authorities.

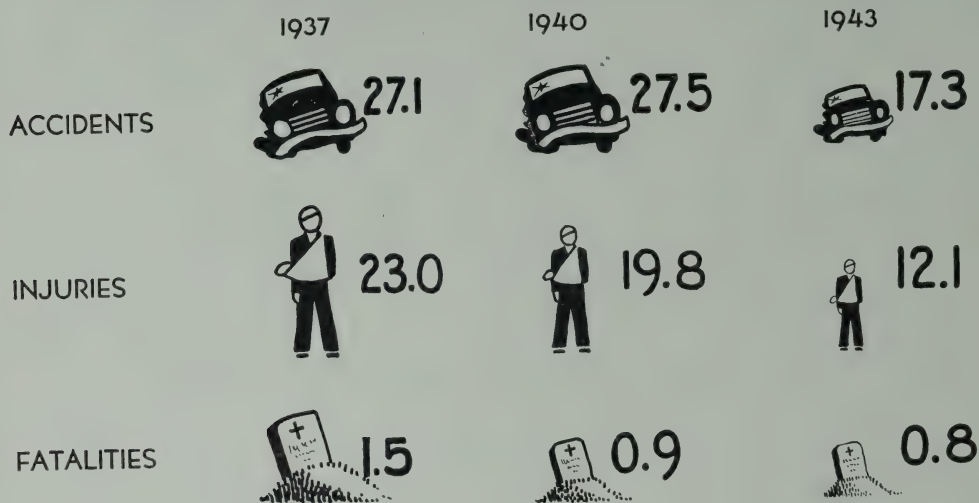
## TRAFFIC STUDIES

Studies were continued for the purpose of collecting, analyzing and presenting facts which measure the relation between traffic behavior and highway design. Emphasis is placed on the ambition to make the highway fit the user, rather than the user fit the highway.

Traffic studies made during the past year were based on the assembling of information collected in previous years. A study of accidents occurring on the State Highway System for a six-year period beginning in 1937, included 55,198

# PROGRESS IN SAFETY

## STATE HIGHWAY SYSTEM



NUMBER OF ACCIDENTS, INJURIES AND FATALITIES PER 10,000,000 CAR MILES

accidents and 41,646 injuries. The study also included 2,885 fatalities in an eight-year period beginning in 1935.

There was an average of 1.1 fatalities, 19.7 injuries and 26.1 accidents per 10,000,000 car-miles traveled during the period studied. The survey shows the effect of highway betterment on the accident rates; the comparison of accident experience on two-, three- and four-lane divided and undivided roads; the accident rates on each highway by routes, counties and municipalities for each year, for the total period studied, and many other valuable summaries.

### *Time Losses*

A measure of highway congestion was developed, illustrating the increase of time losses to traffic caused by increases in the density of traffic. A classification of roadway capacities by number of lane types was also developed.

The probable time losses, extra travel distance, and safety for alternate proposed plans for highway intersection improvement, were measured as an aid in the selection of the best type of intersection.

### *Pedestrians*

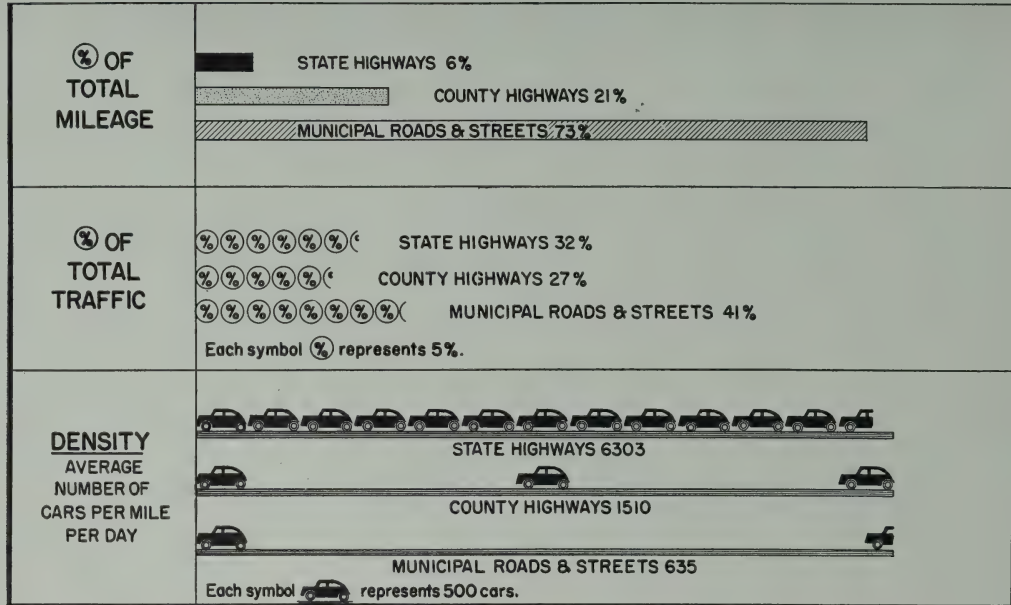
One of the problems that demands increasing attention is better provision for pedestrian traffic along and crossing state highways. The prevailing speed of automobiles is about twelve times that of pedestrians. Motorists are not always too careful to respect the rights nor to sense the limitations of pedestrians.

On the other hand, pedestrians do not always realize the speed of automobiles, gauge time and distance correctly, or realize the deficiencies of some motorists, and the limitations of motorists' control of their vehicles. It is not a simple matter to accommodate these two disparate types of highway users without too much compromise by one or both groups.

### *Bus Stops*

Allied with the pedestrian problem is that of bus stops along the road to take on and discharge passengers. In addition to the hazards to bus patrons are those to traffic caused by bus stops and busses weaving in and out of the moving

# RELATIVE MILEAGES, VOLUMES & DENSITIES ON VARIOUS ROAD SYSTEMS IN NEW JERSEY



lanes at varying speeds. The need for special road construction in some places to reduce these hazards should receive further study. On some highways, perhaps, such bus stops should be prohibited, requiring the bus to leave the road for local service.

### *Stops at Grade Crossings*

Another situation causing confusion and congestion is that of the compulsory stopping of trucks and busses at railroad crossings which must remain at grade because the cost of their elimination cannot be justified because of the infrequency of rail operations. Other vehicles do not stop, and this has caused several accidents. In view of the fact that a flagman must precede the train to the crossing to stop highway traffic, it is difficult to see the merit of this requirement as applying to heavy traffic arteries.

The problem is not altogether an engineering matter, but rather one of regulation involving both state and federal authority. A makeshift arrangement of paving the shoulder for a short distance on either side of the crossing has been used, but it is not too satisfactory.

### *Technical Societies*

The importance of the continuing association of Department engineers with the activities of technical societies concerning highway problems cannot be too greatly emphasized.

The Department now has representation in the American Society for Testing Materials, the American Association of State Highway Officials, and the American Concrete Institute. The work of these organizations is invaluable, particularly the phases concerning highway and bridge construction. The greatest value secured from contact with these organizations, is the research work carried on by them in the development of tests and specifications for new materials.

Serious consideration is being given to setting up a joint advisory committee composed of representatives of this Department and the faculty of the Engineering School of Princeton University to undertake research in various technical problems confronting the Department.

## CONSTRUCTION PLANS

With the curtailment of construction activities, an opportunity is presented for the first time in many years to weigh properly the relative merits of lines of location, details of design, standardization, and coordination of procedure, so that future highway facilities may be better planned and a sufficient time afforded for the purchase of rights of way.

The strides made in highway transportation in recent years have demanded a corresponding increase in the facilities to accommodate it efficiently in a reasonably safe and comfortable manner. During the early stages of highway development, the major problem was to provide pavements on existing roads that would better withstand the weight of light and comparatively slow-moving vehicles. The advent of the fast-moving vehicle, and especially the tremendous increase in fast heavy-trucking, now demands facilities far different from those of our earlier highways.

New Jersey is confronted with problems far in advance of those facing practically any other State, inasmuch as its highways must carry abnormal volumes of traffic, confined within a relatively small area. The situation is particularly complicated because of the large volumes of conflicting and crossing traffic at intersections.

In future planning the endeavor must be to locate and design in accordance with the fact that THE COST OF VEHICLE OPERATION IS TREMENDOUS AS COMPARED WITH THE COST OF CONSTRUCTION; to bear in mind the many things that will reduce the cost of vehicle operation; to evaluate the various factors of design and construction in terms of service; and to keep these in their proper proportion.

Plans for 44 projects throughout the State are in various stages of completion, and some of the more important ones from the point of service to commercial and passenger traffic are herewith outlined.

### *Route 25—Highway Grade Separations*

Delay and congestion on Route 25 between New Brunswick and Newark has been the subject of much study for a



*Ewing Galloway.*

Congestion on Route 25 (U. S. 1) between Newark and New Brunswick caused by traffic signals and cross streets.



By constructing 22 over-passes of this type congestion will be eliminated.

period of years. Conclusions reached indicate that by separating the grades at 22 intersecting thoroughfares, and eliminating all signal lights and crossing traffic, the capacity of this artery will be increased by at least 40 per cent, with a considerable saving in time. Traffic on the intersecting thoroughfares will be benefited correspondingly.

### *Route 25, Newark*

Modernization of the section of Route 25 through Newark will be undertaken at the same time, by the construction of an express highway consisting of two-lane roadways in each direction, one lane for fast-moving and one for slow-moving traffic, with crossing traffic at grade eliminated. Service roads can be developed on each side for local traffic. These improvements will greatly facilitate the trucking of produce from South Jersey counties, aid the large volume of commercial and industrial traffic in this area, and facilitate recreational traffic to the New Jersey shore resorts.

The increased capacity of the highway and the resultant saving in time, will be an inducement to a greater number of people in the New York metropolitan area to visit the shore resorts. It will also facilitate commercial and agricultural trucking from counties lying to the west, which comes in over Route 29 and combines with Route 25 at the Newark Airport.

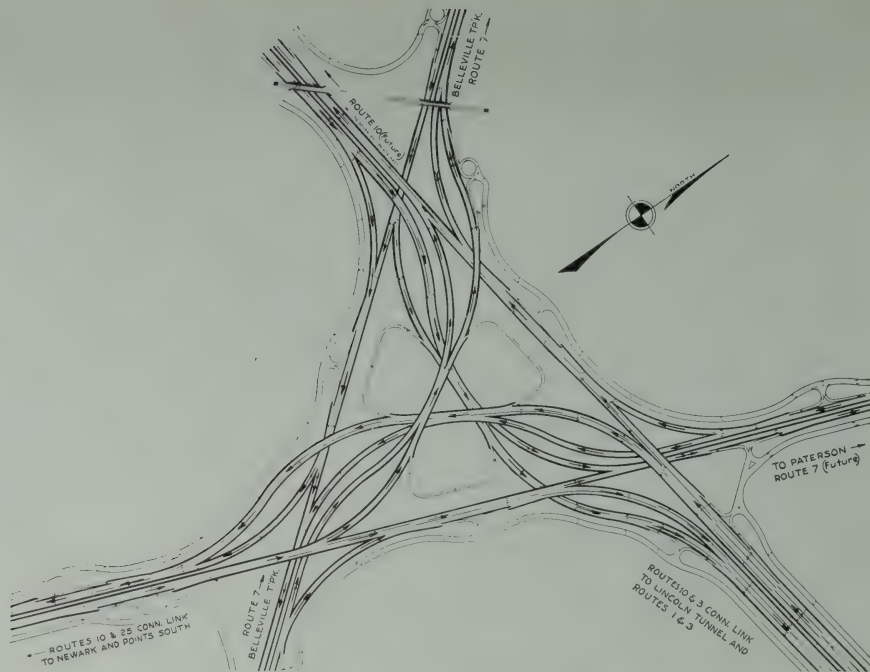
### *Connection to Lincoln Tunnel*

The next step in the development of the northern metropolitan area calls for the construction of a direct artery to the Lincoln Tunnel from Route 25 at the west end of the Pulaski Skyway in Newark, designed to provide major intersection facilities on the meadows in Kearny to accommodate the ultimate construction of Route 10 through Essex and Hudson Counties.

This will not only provide a shorter and time-saving approach to the Lincoln Tunnel, but will relieve the Skyway and its parallel low-level route over the old Lincoln Highway of an increasing weight of traffic that can be accommodated by the enlarged facilities to the south.



Proposed non-stop intersection—Lincoln Tunnel Connection—Routes 7 and 10 in Kearny.



Complicated in plan because the eye sees too much at one time. Simple in operation because the drivers see little that is not necessary.

### *Route 100 and S-100*

The modernization of Route 25 through Newark, and the construction of the Lincoln Tunnel connection, will eventually create too much traffic for Route 25 from Elizabeth south to the Raritan River. The next step will be the construction of that part of Route 100 and S-100 paralleling Route 25 to the east. The ultimate step will be the completion of Route 100.

This will open up and provide outlets for potentially great industrial areas lying isolated on the North Jersey meadows. For many reasons it will be of great economic benefit, not only to the metropolitan area in particular, but to New Jersey as a whole.

### *Camden*

A fan of state highways—Routes 25, 38, 40, 42, 43 and 45—converges upon Camden. The Admiral Wilson Boulevard, or Entrance Road, constitutes the handle of the fan leading to the Delaware River Bridge. Congestion and inadequate facilities for interchange is interfering with industrial, commercial, commuter, and recreational traffic in the Camden area.

To relieve this situation it is planned to widen and channelize the Admiral Wilson Boulevard from the Bridge Plaza to the Camden Airport Circle, and construct grade separations in the area to provide traffic interchange and increased capacity, by eliminating heavy crossing traffic at grade.

This will serve the business interests of Camden and make outlying sections of Camden and Gloucester Counties more desirable for further development, particularly for residential purposes. It will also facilitate traffic to shore resorts.

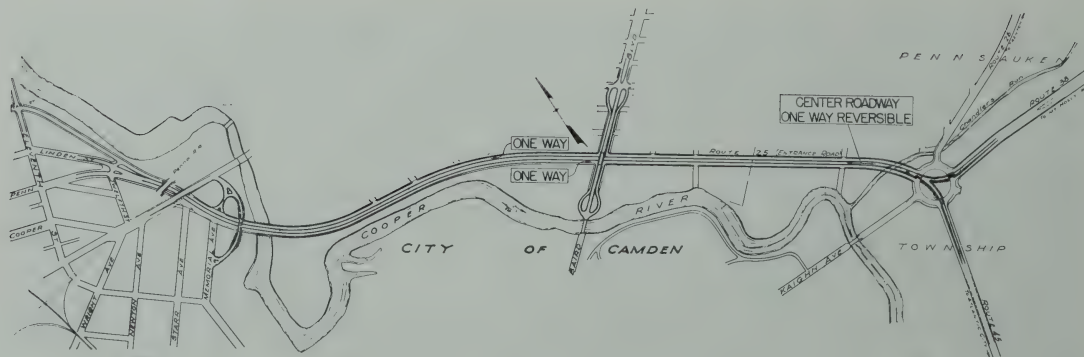
### *Route 21, Newark*

Plans are under way for the completion of the gap on Route 21 through Newark, between Clay Street and Chester Avenue. At present, traffic must use existing narrow streets through this area, interposing four right angle turns, traffic lights and all the disadvantages of an inadequate facility.

This construction will provide a through north-south ar-



Proposed Route 100—George Washington Bridge at Fort Lee to the Raritan River.



Proposed grade separation at Baird Boulevard and revision of Admiral Wilson Boulevard (Camden Entrance Road).  
Center roadway provides extra lanes in the direction required for morning and evening rush hours.

tery from Route 25 at the Newark Airport to Belleville, and will also accommodate a large amount of traffic generated along its five-mile length.

#### *Route 25-A*

Another important artery in this area is Route 25-A, planned to extend from a point west of Broad Street in Newark easterly to the heavy industrial area of Harrison. Bridges will carry this highway over Broad Street and Route 21, with a new drawbridge over the Passaic River, immediately north of the Lackawanna Railroad.

The drawbridge will have an underclearance of 35 feet which will eliminate over 75 per cent of the bridge openings for river traffic. It is expected that the foundations for this new structure will be started during 1944.

#### *Route S-3*

This route is being designed as an express highway. In conjunction with Route 3 at its easterly end and Route 6 at its westerly end, it will form a part of the major highway artery from the west and northwest leading to the Lincoln Tunnel, with great benefit to intermediate communities.

It will place certain areas of upper Essex and lower Passaic Counties, at present relatively remote, within 15 minutes driving time of New York City, and also provide rapid transportation for large centers of population to the mountain and lake resorts of northern New Jersey. In addition, a modern outlet to the west will be provided for that part of Hudson County hemmed in to the east of the Hackensack meadows.

Construction has been resumed on the north tube of the Lincoln Tunnel in anticipation of its opening late in 1944. Federal approval is expected for proceeding with the completion of the section of Route S-3 crossing the Hackensack meadows between Rutherford and East Rutherford in Bergen County so that it may be completed coincident with the tunnel opening.

The portion of Route 3 involved in this plan will be relocated around the built-up section of Secaucus to fit in with the



Existing and proposed alignments of Routes 3 and S-3.

design of Route S-3. This part of Route 3 was constructed in 1928 prior to the projection of the Lincoln Tunnel, and has become a bottleneck through Secaucus which seriously affects community activities.

#### *Route 6—Denville to Netcong*

The great dairy industry and recreational areas of northern New Jersey will be benefited by the dualization of Route 6 westerly from Denville to Route 31 at Netcong. Plans call for by-passing the congested Dover area to the north, utilizing the recently completed access road facilities at Picatinny Arsenal. The project is designed to accommodate the intersection of Routes 6 and 6-A.

A heavy volume of commercial traffic uses Route 6 through Dover, an industrial area and the commercial center of this part of Morris County. A greater volume of traffic will develop as improvements are consummated on Route 6 to the east and on Route S-3. Moreover, Dover will be relieved of the heavy volume of trucks and commercial vehicles, and through traffic of the delays, tension and hazard of traveling through a busy community.

This by-pass will also eliminate a troublesome problem at Mine Hill, where the heavy grades have delayed traffic and presented a serious problem for many years.

#### *Route 6—Little Falls to Pine Brook*

The section of Route 6 from Little Falls Station westerly to Pine Brook has become inadequate. This highway was constructed in 1927 with a 20-foot pavement width. Feeding into it on the west is the portion of Route 6 dualized in 1941, with two modern 20-foot roadways, and on the east by the recently completed link of Route 6 through Great Notch, with two 24-foot roadways.

Connecting with this section at Singac is Route 23, which extends northwesterly through Passaic, Morris and Sussex Counties to Port Jervis. Extremely bad traffic conditions exist along this highway, and have particularly interfered with access to the Caldwell plant of the Wright Aeronautical Corporation.



Inadequate section of Route 6 (U. S. 46) between Little Falls and Pine Brook.



Adjacent section of same route adequate as rebuilt.

The modernizing of this section, with the proposed dualization between Little Ferry and Fort Lee, will provide a modern traffic artery from the George Washington Bridge to Netcong.

### *Route 28*

For many years heavy cross-state commercial traffic on Route 28 between Somerville and Clinton, has caused congestion and hazard, been a detriment to the transportation of agricultural products from the surrounding area into metropolitan markets, and interfered with the normal activities of the several communities through which it passes. The existing highway was completed some 20 years ago.

By-passes of North Branch, White House and Lebanon have recently been completed, and provide dual highways at these locations. It is planned to close the existing gaps with dual construction. A later step will be to continue the improvement of this route westerly to a connection with modern facilities already provided approaching Phillipsburg from Still Valley in Warren County.

Plans completed call for modernization of that section of Route 24 which comprises the part of this general artery leading through Phillipsburg to the Delaware River Bridge.

### *Route 35*

Route 35 is a dual artery with crossing traffic minimized by highway grade separations from Route 25 southerly through the Amboys to Laurence Harbor.

A four-mile bottleneck exists from a point south of Laurence Harbor to Keyport, where Route 36 begins and extends along the bay front to Highlands, Route 35 continuing southeasterly through Red Bank toward Asbury Park and points south. Modernization of this gap is actually related to improvements proposed on Route 25 through the metropolitan area, insofar as facilitating recreational and commercial traffic to North Jersey shore resorts is concerned.

It is planned to relocate the highway toward the west and provide a dual, grade-separated highway, with 24-foot roadways each side of a 30-foot center island.



Existing Route 28 (U. S. 22) through Annandale, Hunterdon County,  
to be relocated.



Relocated portion of same route.

### *Trenton*

Commercial and industrial Trenton is suffering from congestion and economic loss because of conflicting traffic movements over narrow streets, laid out for provincial purposes during the early 19th century. Studies are under way toward developing a plan to serve commercial and industrial interests, together with the large amount of traffic generated in this area, and also relieving the community of the large volume of through traffic. In anticipation of a new bridge at Calhoun Street, certain revisions will necessarily be made to facilitate movements on the approaches to and from the bridge as well as cross-movements parallel to the river.

The general scheme being considered would utilize the abandoned portion of the old Delaware and Raritan Canal to provide a dual, grade-separated artery from the Delaware River at Bridge Street to the Brunswick Pike (Route 26) with ample provisions for directional interchange.

The plan will also be developed to accommodate Route 29 extending from Lambertville, and a new artery to follow the old canal bed southerly to connect with Route 39 south of White Horse in Burlington County.

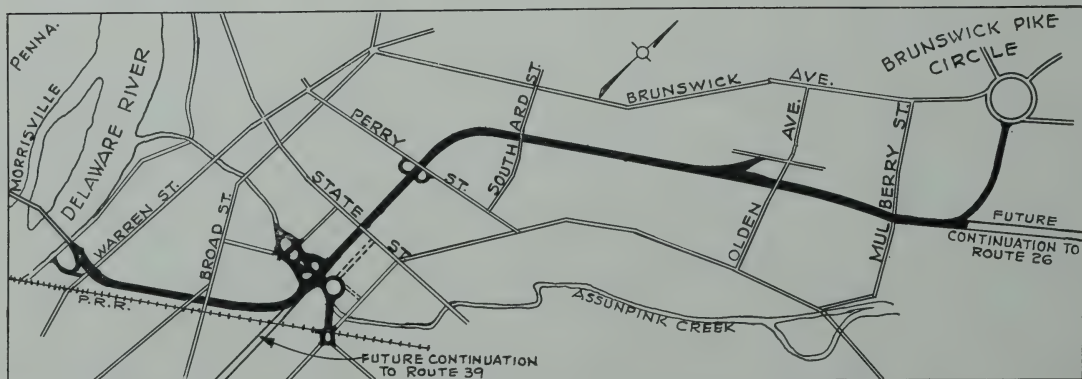
### *Route 44*

To serve commercial and industrial enterprises adequately along the Delaware River waterfront from Westville to Penns Grove, and to open up this territory for greater development, it is planned to complete the dualization of Route 44 from Westville to Bridgeport.

Several of the communities along this route will be bypassed to relieve them of the congestion of through commercial traffic which is interfering with normal community activities.

### *Route 54*

Particularly to facilitate the transportation of agricultural products from Cumberland and Atlantic Counties, and parts of Gloucester and Salem Counties to the New York metropolitan markets, it is planned to complete the construction of Route 54 from Buena to Hammonton, where it connects with



Proposed plan of State Highway through Trenton from the Lower Bridge to the Brunswick Pike Circle,



Plan showing proposed relocation of Route 44, Gloucester County.

Route 39 extending northerly to Route 25 at Bordentown.

### *Route 43*

The inadequate nature of both the White Horse Pike (Route 43) which continues over the Absecon Boulevard (Route 56) into Atlantic City, and the main shoreline artery over Route 4, north and south of Absecon, calls for modernization of these facilities.

The initial step will comprise a five-mile relocation of the White Horse Pike around Absecon, with a grade separation and provisions for directional interchanges at Route 4 to eliminate congestion and delays on both Routes 4 and 43. This will comprise the first link in an ultimate high speed facility, extending across the State to Camden. The Absecon Boulevard (Route 56) will be dualized.

### *Improvement of State Highway System*

Surveys and the preparation of plans are under way for projects estimated to cost \$135,000,000, which is included in the total of needed improvements to the State Highway System as shown by the table and map at the end of the report.

## FINANCIAL

### *Funds*

The revenues anticipated to be available for State Highway Fund purposes under the 1943 Appropriation Act were \$31,-112,000. This was increased to \$37,647,142.86 through the recapture of \$6,535,142.86 of unexpended balances in the Department's 1942 construction, maintenance and WPA programs.

Deductions for General State Fund purposes, General and Educational State Fund deficiencies, defense purposes and salary adjustments for state employees were made in the amount of \$6,731,865.26. In addition, there was reserved against declining revenues, and to meet expenditures of an emergency nature, \$2,869,962.32, leaving an estimated balance of \$28,-045,315.28 available for appropriation.

Due to the fact that the actual revenues received for motor vehicle imposts, motor fuel taxes, the bus excise tax, miscellaneous and other revenues, exceeded the original estimates by \$6,890,360.60, there was available for appropriation the amount of \$34,935,675.88.

### *Appropriations*

Appropriations of \$5,290,098.25 were made for debt service and funding requirements of bonds; \$9,885,000 for the construction and maintenance of county and municipal highways; \$5,598,118.66 for the operation of other state departments; \$32,000 to the Department of Institutions and Agencies for special purposes; and \$7,304,098.37 for construction on and maintenance of the State Highway System, leaving a surplus at the close of the year of \$6,858,360.60.

This amount, together with \$2,869,962.32 reserved against declining revenues, resulted in an unappropriated balance at the close of the year of \$9,728,322.92.

### *Federal Aid—Special Allotments*

In addition to the funds appropriated to the Department under the State Appropriation Act, the Federal Government allotted \$429,225.13 for access road projects to military establishments and war industries, constructed under the super-

vision of the Department and financed by the federal authorities.

The following statements show the revised revenues and appropriations of the State Highway Fund on December 31; the status of departmental appropriations as of the same date, and the assets and liabilities of the State Highway Fund with a comparison of the previous year.

**STATE OF NEW JERSEY**  
**STATE HIGHWAY DEPARTMENT**  
**Statement of Revenues and Appropriations**

YEAR 1943

*Anticipated Revenue of the State Highway Fund:*

Unappropriated Balance forward from Previous Year .....	\$3,122,071.33
Motor Vehicle Fees, Fines, etc. ....	19,453,674.34
Motor Vehicle Inspection Fees .....	290,706.75
Tax on Motor Fuels .....	14,541,457.32
Bus Excise Tax .....	93,820.62
Federal Aid .....	.....
Miscellaneous Revenue .....	500,630.24

Total Estimated Revenue .....	\$38,002,360.60
Balance of 1942 Construction Program, Chap. 107 .....	5,433,597.06
Balance of W. P. A. Program, Chap. 107 .....	150,776.72
Balance of 1942 Maintenance .....	950,769.08

\$44,537,503.46

Less: Transfers

Amounts Transferred to State Fund for:

General Purpose .....	\$275,000.00	
General and Educational Deficiencies...	2,841,865.26	
Defense Purpose .....	365,000.00	
Salary Adjustments of employees paid from State Fund .....	2,500,000.00	
Salary Adjustments of employees paid from Highway Fund .....	750,000.00	6,731,865.26

Total Revenue and Balance Available for Appropriations ..... \$37,805,638.26

**STATE OF NEW JERSEY**  
**STATE HIGHWAY DEPARTMENT**  
**Statement of Revenues and Appropriations—Continued**

*Appropriations for Year 1943*

State Treasurer Debt Service:

State Highway Bonds .....	\$4,761,248.25	
Institution and Agency Bonds .....	528,850.00	\$5,290,098.25

County Aid .....	6,735,000.00
Township Aid .....	3,150,000.00

State Highway Department:

Construction and Purchase of Right-of-Way

State Highway System:

Federal Aid (Matched Money) .....	\$2,000,000.00	
Claims .....	2,886.03	
Maintenance of State Highway System ....	2,850,000.00	
Operation of Bridges .....	325,000.00	
Elec. Installation and Maintenance (Lights) .....	410,000.00	
Inst. Roads and Approaches .....	162,500.00	
Plant and Equipment .....	66,000.00	
Adm., Engr., Insp. and Administrative Cost of Acquiring Right-of-Way .....	1,487,712.34	\$7,304,098.37

Motor Vehicle Department .....	1,741,956.17
Motor Fuel Tax Division .....	227,710.00
Department of State Police .....	796,330.34
Board of Commerce and Navigation .....	498,000.00
Delaware River Joint Toll Bridge Commission .....	61,708.00
State Employees' Retirement System .....	134,713.00
Delaware and Raritan Canal Commission .....	13,000.00
Compensation Awards (other than Highway Dept.) .....	5,000.00
Teachers' Pension and Annuity Fund .....	2,087,701.15
Department of Institutions and Agencies (Chap. 133, P. L. 1943) .....	32,000.00

TOTAL ..... \$28,077,315.28

Reserve against declining revenue or to meet expenditures of  
an emergency nature ..... \$2,869,962.32

Surplus ..... 6,858,360.60

TOTAL ..... \$37,805,638.20

**STATE OF NEW JERSEY**  
**STATE HIGHWAY DEPARTMENT**  
**Status of Appropriations as of December 31, 1943**

	<i>Allocation of Funds Year 1943</i>	<i>Disbursements to Dec. 31, 1943</i>	<i>Outstanding Contracts and Commitments Dec. 31, 1943</i>	<i>Balance of Appropriations Dec. 31, 1943</i>
<i>Classification of Expenditures:</i>				
Construction of State Highway System:				
Road Construction .....	\$2,421,986.43	\$1,418,957.40	\$1,003,029.03	.....
Bridge and Grade Crossing Contracts .....	1,915,006.00	805,676.31	1,109,329.69	.....
Purchase of Right-of-Way .....	5,111,138.02	708,537.95	4,402,600.07	.....
Balance of Construction Program:				
Motor Vehicle Fees, etc. ....	98,894.70	.....	.....	\$98,894.70
Federal Aid (Matched Money) .....	7,584,116.83	.....	.....	7,584,116.83
Construction Route 25-A, Road, Bridge and Right-of-Way.....	1,000,000.00	217,703.48	24,896.18	757,400.34
Claims .....	8,126.57	8,097.23	.....	29.34
Bond Fund .....	501,829.58	.....	.....	501,829.58
<b>TOTAL STATE HIGHWAY CONSTRUCTION FUNDS .....</b>	<b>\$18,641,098.13</b>	<b>\$3,158,972.37</b>	<b>\$6,539,854.97</b>	<b>\$8,942,270.79</b>
W. P. A. Sponsor's Share—State Highway Projects .....	\$86,838.38	\$83,882.15	.....	\$2,956.23
Maintenance of State Highway System:				
Roads and Bridges .....	4,197,559.27	3,077,707.74	\$777,212.02	342,639.51
State Highway Lighting and Operation of Bridges:				
Electrical Installation and Maintenance .....	870,689.17	501,185.22	224,397.59	145,106.36
Operation of Bridges .....	405,925.66	373,760.70	4,530.00	27,634.96
Purchase of Plant and Equipment .....	277,534.44	62,661.89	136,647.59	78,224.96
Admin., Engr., Insp., and Administrative Cost of Acquiring Right- of-Way .....	1,839,342.72	1,638,065.78	56,500.00	144,776.94
<b>TOTAL .....</b>	<b>\$7,677,889.64</b>	<b>\$5,737,263.48</b>	<b>\$1,199,287.20</b>	<b>\$741,338.96</b>

# STATE OF NEW JERSEY

	<i>Allocation of Funds Year 1943</i>	<i>Disbursements to Dec. 31, 1943</i>	<i>Outstanding Contracts and Commitments Dec. 31, 1943</i>	<i>Balance of Appropriations Dec. 31, 1943</i>
Miscellaneous Projects:				
Instl. Roads and Approaches .....	\$208,404.98	\$118,378.18	\$90,026.80	.....
1942 Appropriations Cancelled, Chapter 107, P. L. 1943 .....	.....	.....	.....	.....
TOTAL .....	\$208,404.98	\$118,378.18	\$90,026.80	.....
TOTAL (DEPARTMENTAL APPROPRIATIONS) .....	\$26,527,392.75	\$9,014,614.03	\$7,829,168.97	\$9,683,609.75
Statutory Increase .....	362,000.00	342,716.89	.....	19,283.11
War Adjustment .....	183,500.00	172,648.81	.....	10,851.19
Improvement of Water Reservoirs (Chapter 133, P. L. 1943) ....	46,643.00	34,558.55	12,084.45	.....
County and Township Aid (Mandatory):				
County Aid .....	\$7,870,955.83	\$6,624,777.32	\$1,246,178.51	.....
Township Aid—				
Construction .....	3,307,289.52	1,488,510.51	1,818,779.01	.....
Maintenance .....	1,023,745.96	336,828.91	686,917.05	.....
State Aid to County Appropriations (Chapter 395, P. L. 1912) .	.....	.....	.....	.....
State Treasurer's Investment Account .....	2,008,450.48	.....	2,008,450.48	.....
TOTAL (COUNTY AND TOWNSHIP AID APPROPRIATIONS) .....	\$14,210,441.79	\$8,450,116.74	\$5,760,325.05	.....
Federal Aid (Special Allotments):				
Grade Crossing Proj. W. P. G. (100%) .....	\$19,050.80	.....	.....	\$19,050.80
Grade Crossing Hazards (100%) .....	1,382,914.91	\$112,879.91	\$82,577.31	1,187,457.69
Secondary and Feeder Roads (50%) .....	719,228.05	40,481.89	122,845.19	555,900.97
Federal Defense Access Projects (100%) .....	3,472,888.16	2,402,341.38	949,606.78	120,940.00
Advance Engr. Studies Route 100 (50%) .....	127,368.00	.....	127,368.00	.....
Strategic Highway Network (75%) .....	416,453.50	201,088.33	207,598.67	7,766.50
Miscellaneous Receipts .....	.....	.....	.....	.....
TOTAL (FEDERAL AID SPECIAL ALLOTMENTS) .....	\$6,137,903.42	\$2,756,791.51	\$1,489,995.95	\$1,891,115.96
GRAND TOTAL .....	\$47,467,880.96	\$20,771,446.53	\$15,091,574.42	\$11,604,860.01

## ASSETS

	<i>Dec. 31, 1942</i>	<i>Dec. 31, 1943</i>
Cash Balance .....	\$12,954,740.21	\$13,655,424.95
Cash Due from Motor Vehicle Department and Gas Tax Division Account of 1942 and 1943 Collections .....	1,766,097.40	1,889,970.45
Federal Aid Allot. Regular 50%-50% .....	3,410,690.47	2,383,444.50
Federal Aid Allot. Natl. Ind. Recov. Fund ....	3,328.09	3,328.09
1930 Bond Issue Authorized .....	11,178,900.00	11,178,900.00
Undistributed Material .....	448,398.84	346,678.36
Plant and Equipment .....	1,361,545.62	1,255,354.15
Loan to Port of New York Authority, Chapter 121, P. L. 1940 .....	4,300,000.00	4,300,000.00
Prepaid Insurance .....	.....	76,779.90
<b>TOTALS</b> .....	<b>\$35,423,700.63</b>	<b>\$35,089,880.44</b>

**STATE OF NEW JERSEY**  
**STATE HIGHWAY DEPARTMENT**  
**Statement of Total Assets and Liabilities**

**Years Ending December 31, 1942 and December 31, 1943**

LIABILITIES		
	<i>Dec. 31, 1942</i>	<i>Dec. 31, 1943</i>
Road Contracts .....	\$2,619,073.98	\$1,003,029.03
Bridge Contracts .....	1,977,585.40	1,109,329.69
Claims .....	5,240.54	29.34
W. P. A. Sponsor's State Share:		
Projects in Work .....	305,489.32	.....
Balance of Appropriation .....	150,897.15	2,956.23
Purchase of Right-of-Way .....	4,556,138.02	4,402,600.07
Balance of Construction Appropriation:		
Motor Vehicle Fees, etc. ....	5,336,678.09	98,894.70
Federal Aid Matched Money .....	5,672,190.19	7,584,116.83
Bond Fund .....	1,000,195.44	501,829.58
Route 25-A, Road, Bridge, Right-of-Way Contracts .....		24,896.18
Route 25-A, Road, Bridge, Right-of-Way Balance Approp. ....	1,000,000.00	757,400.34
Allotment to Counties for Maintenance, Construction, Reconstruction of Roads and Bridges, Bonds and Int., Police and Lighting, etc. ....	1,378,151.12	1,246,178.51
Allotment to Townships and Boroughs for Construction of Roads and Bridges .....	2,329,118.52	1,818,779.01
Allotment to Townships and Boroughs for Maintenance of Roads and Bridges .....	606,295.27	686,917.05
State Treasurer's Investment Account .....		2,008,450.48
Allotment for Purchase of Plant and Equipment .....	211,534.44	214,872.55
Allotment for Maintenance of Highways, Roads and Bridges .....	1,879,556.98	1,119,851.53
Allotment for Lighting of State Highway System and Operation of Bridges:		
Electrical Installation and Maintenance .....	460,689.17	369,503.95
Operation of Draw Bridges .....	80,925.66	32,164.96
Allotment for Approaches to Public Institutions .....	45,904.98	90,026.80
State Aid Appropriations (Chap. 395, P. L. 1911) .....	12,789.03	.....
Surplus Investment in Plant and Equipment ....	1,361,545.62	1,255,354.15
Reserved to Motor Fuel Tax Department for Unpaid Gas Tax Refund Claims .....	650,000.00	650,000.00
Allotment Township of Galloway .....	110,000.00	110,000.00
Allotment for Admin., Engr., Inspec. and Cost of Acquiring Right-of-Way .....	551,630.38	201,276.94
Statutory Increase .....		19,283.11
War Adjustment .....		10,851.19
Improvement of Water Reservoirs (Chap. 133, P. L. 1943) .....		12,084.45
Compensation Awards (Other than Highway Dept.) .....		4,924.00
Salary Adjustments Paid from Highway Fund..		25,956.81
Unappropriated Balance .....	3,122,071.33	9,728,322.92
	<hr/> \$35,423,700.63	<hr/> \$35,089,880.40



Route 29 (U. S. 22) between Newark and Somerville, lined with roadside stands, filling stations and billboards.



New Jersey needs Parkways like this!

## FUTURE HIGHWAY TRENDS

Every great change in world affairs affects men's minds, their methods as well as their objectives. The shape of things to come becomes discernable against the background of past trends.

Highway development has experienced a series of epochal changes in the past. The transition from the old wagon road which became impassable with the mud to a smooth all-weather surface road and to the modern paved surfaces to accommodate the increasing use of the motor vehicle records such an upheaval. This transition is not finished; we are even now planning the highways of the future.

Old means of transportation have had their effect on the changing use of land, the habits of our citizenry, the changing methods of doing our day's work and utilizing our leisure hours. Newer means are likely to be even more revolutionary in their effects. The war scarcity of rubber and gasoline has emphasized the extent to which the automobile, as a new means of transport, is causing changes. Easy accessibility to more places for the many has changed even the homes we live in—both as to kind and as to location. Dependence on mass transportation is giving ground to reliance on individual transportation. This wider freedom to choose where we shall live, where we shall work and shop and visit and find amusement has changed basic social habits. Farmers have long since sensed this new freedom and advantage has been taken of selective and wider markets—including the roadsides. Industrialists have found new and profitable sites away from the city. Industry is thus no longer chained to any one source of labor supply nor to a single method of transport.

Our cities were laid out for older means of transport. The effect of the automobile could not have been foreseen. Newer land developments fit this new vehicle better; old developments suffer blight until rejuvenated and adapted to the new ways.

This trend seems likely to continue its course until all our old pattern of development has been adjusted to a fuller realization of the motor vehicle. This means that the highway

net work must be shaped to meet the needs of the new pattern. The State system of highways must form the backbone of that network. To perform its function it must be always ready to carry vehicles comfortably, speedily, safely and directly from locality to locality, and from region to region.

With the construction of its great commercial arteries, New Jersey finds itself confronted with the problem of making available to its citizens and those of other states more adequate access to its seashore, lake and mountain regions. That well recognized need has given a new public emphasis to the next important development in the State, namely, the development of a system of Parkways and Freeways.

## PARKWAYS AND FREEWAYS

The development of parkways in this country is less than forty years old. The Bronx River Parkway in Westchester County, the first parkway system to be constructed in the United States, which was first planned in 1906, was begun in 1916 and completed after the last World War. Subsequently the development of the Hutchinson River Parkway in New York, the Grand Central Parkway in Long Island, the Merritt Parkway in Connecticut and the Mt. Vernon Memorial Parkway in the District of Columbia, to mention a few, have led the way in this most important development.

The distinction between a parkway and a freeway is important to understand at the outset. A parkway, according to the definition of Mr. Edward M. Bassett, the recognized authority on planning, is "a strip of land dedicated to recreation, over which the abutting owners have no right of light, air or access." An expressway, on the other hand, is "a strip of land dedicated to movement, over which the abutting owners have no right of light, air or access." The difference is thus one not so much of design as of function. Both parkways and expressways are to be considered as important parts of integrated highway systems; both deny access to abutting property owners. A parkway, however, enables passenger vehicles to travel from heavily populated areas of the country to large recreational areas. It relieves the overburdened mixed



Highway.



Parkway.

TYPES OF ROADSIDE FACILITIES.

traffic highways of the passenger vehicles, leaving room for commercial traffic and local mixed traffic.

The freeway or expressway, as it is sometimes described, is similarly integrated with the highway system but is designed for through mixed traffic, without crossings at grade, with infrequent public entrances and access, with or without service roads. Upon the latter road trucks would have the right of complete use. In the case of a parkway, trucks and commercial vehicles would be excluded by law.

But beyond legal definition or even the specific function of the road, there is the recognized intention in the construction of both parkway and freeways to preserve for the motorists, as well as for the residents of the State, the natural beauty of the countryside and make possible not only speed and comfort, but to satisfy the aesthetic instincts in man. Every highway system as it develops is destined to create systems of parkways and freeways in the evolution toward a finer system of road transport.

In New Jersey this trend is already distinguishable. For the past twenty-five years there has been constructed in this state a network of commercial roads connecting important centers of population within the State and serving the vast volume of inter-state traffic between New York and Pennsylvania. In all, 350 millions of dollars have been invested in this System; 303 millions of which have come from the taxpayers and motorists of this State and 47 millions from the Federal government, a partial return of the Federal imposts collected from New Jersey motorists. Each decade has seen a widening of the State's right of way from a minimum of fifty feet up to two hundred and fifty feet on the arterial routes. Roads have evolved from a two-lane road to a four-lane divided highway, with the construction of overpasses at intersections and the elimination of sharp curvatures in the road and with wider provision for landscaping.

Five years ago the State Highway Department embarked upon the first parkway development in this State on Route 40, the John Davison Rockefeller Memorial Highway, with a right of way of 520 feet. This protected section

of parkway is 15 miles long. Taken together with other sections on Routes 40, 38, 34 and 35, as designated by the Legislature, we have in all about 60 miles of what is contemplated to be a protected parkway in the state. The evolution of the New Jersey system has proceeded without benefit of enabling legislation for the construction of either parkways or freeways. The limitation has become increasingly apparent. The need for such a system of parkways and freeways has also become apparent.

The construction of parkways has inevitably been followed by a great enhancement of real estate values. The extensive construction of parkway systems in other localities has done much to increase property values many times over in the past several years.

Bills embodying the sound principles of parkway legislation have been introduced into the State Legislature over the past few years and there is every reason to believe that this legislation will be acted upon affirmatively in the not too distant future, in order that the State may more adequately plan for its future highway development.

Today, New Jersey stands upon the threshold of this development. With its plan on Route 4, with the possible development also of the Palisades Interstate Parkway and with other routes about the State. At such time as the Legislature decides to enact the requisite enabling legislation, New Jersey can move forward in the development of a system of parkways and freeways which will bring to the State the same distinction for highway design as has come to the State in the past in the development of its commercial routes. New Jersey, which has been called the "Garden State" deserves a system of parkways and freeways to make available to all its citizens the beauties with which nature has endowed the State.

# SUMMARY OF NEEDED IMPROVEMENTS TO LEGISLATED STATE HIGHWAY SYSTEM

COUNTY	TAKEN OVER		NOT TAKEN OVER		TOTALS	
	CONSTRUCTION OR RECONSTRUCTION					
	Miles	Estimated Cost	Miles	Estimated Cost	Miles	Estimated Cost
Atlantic .....	63	17,530,000	51	15,350,000	114	32,880,000
Bergen .....	43	11,460,000	58	29,750,000	101	41,210,000
Burlington .....	24	4,070,000	15	5,300,000	39	9,370,000
Camden .....	33	14,560,000	24	7,300,000	57	21,860,000
Cape May .....	29	9,000,000	9	4,500,000	38	13,500,000
Cumberland .....		750,000	18	3,600,000	18	4,350,000
Essex .....	21	14,770,000	42	83,700,000	63	98,470,000
Gloucester .....	40	9,150,000	30	8,600,000	70	17,750,000
Hudson .....	8	5,300,000	26	30,800,000	34	36,100,000
Hunterdon .....	23	7,320,000	27	6,350,000	50	13,670,000
Mercer .....	26	3,800,000	55	21,400,000	81	25,200,000
Middlesex .....	22	8,820,000	23	10,950,000	45	19,770,000
Monmouth .....	68	21,770,000	30	8,000,000	98	29,770,000
Morris .....	43	16,820,000	45	14,850,000	88	31,670,000
Ocean .....	32	10,300,000	36	7,350,000	68	17,650,000
Passaic .....	22	7,350,000	28	12,200,000	50	19,550,000
Salem .....	16	4,570,000	5	2,000,000	21	6,570,000
Somerset .....	22	6,960,000	19	3,270,000	41	10,230,000
Sussex .....	16	4,280,000	39	8,150,000	55	12,430,000
Union .....	8	8,370,000	31	27,350,000	39	35,720,000
Warren .....	29	6,200,000	5	1,350,000	34	7,550,000
Totals .....	588	193,150,000	616	312,120,000	1204	505,270,000
PROPOSED ADDITIONS TO STATE HIGHWAY SYSTEM (Not included in above Summary)					7	16,500,000
TOTAL NEEDED IMPROVEMENTS TO STATE HIGHWAY SYSTEM					1211	521,770,000



# SUMMARY OF NEEDED IMPROVEMENTS TO LEGISLATED STATE HIGHWAY SYSTEM

COUNTY	TAKEN OVER		NOT TAKEN OVER		TOTALS	
	CONSTRUCTION OR RECONSTRUCTION					
	<i>Miles</i>	<i>Estimated Cost</i>	<i>Miles</i>	<i>Estimated Cost</i>	<i>Miles</i>	<i>Estimated Cost</i>
Atlantic .....	63	17,530,000	51	15,350,000	114	32,880,000
Bergen .....	43	11,460,000	58	29,750,000	101	41,210,000
Burlington .....	24	4,070,000	15	5,300,000	39	9,370,000
Camden .....	33	14,560,000	24	7,300,000	57	21,860,000
Cape May .....	29	9,000,000	9	4,500,000	38	13,500,000
Cumberland .....		750,000	18	3,600,000	18	4,350,000
Essex .....	21	14,770,000	42	83,700,000	63	98,470,000
Gloucester .....	40	9,150,000	30	8,600,000	70	17,750,000
Hudson .....	8	5,300,000	26	30,800,000	34	36,100,000
Hunterdon .....	23	7,320,000	27	6,350,000	50	13,670,000
Mercer .....	26	3,800,000	55	21,400,000	81	25,200,000
Middlesex .....	22	8,820,000	23	10,950,000	45	19,770,000
Monmouth .....	68	21,770,000	30	8,000,000	98	29,770,000
Morris .....	43	16,820,000	45	14,850,000	88	31,670,000
Ocean .....	32	10,300,000	36	7,350,000	68	17,650,000
Passaic .....	22	7,350,000	28	12,200,000	50	19,550,000
Salem .....	16	4,570,000	5	2,000,000	21	6,570,000
Somerset .....	22	6,960,000	19	3,270,000	41	10,230,000
Sussex .....	16	4,280,000	39	8,150,000	55	12,430,000
Union .....	8	8,370,000	31	27,350,000	39	35,720,000
Warren .....	29	6,200,000	5	1,350,000	34	7,550,000
Totals .....	588	193,150,000	616	312,120,000	1204	505,270,000
PROPOSED ADDITIONS TO STATE HIGHWAY SYSTEM (Not included in above Summary)					7	16,500,000
TOTAL NEEDED IMPROVEMENTS TO STATE HIGHWAY SYSTEM					1211	521,770,000

